Analog electronics

Titulaire
François QUITIN (Coordonnateur)

Mnémonique du cours
ELEC-H402

Crédits ECTS
5 crédits

Langue(s) d'enseignement
Anglais

Période du cours
Deuxième quadrimestre

Campus
Solbosch

Contenu du cours

Table of contents:

1. semiconductor basics
2. PN junction and diodes
3. MOSFET transistors
4. Single-stage MOSFET amplifiers
5. Differential amplifiers
6. BJT transistors and amplifier circuits
7. VLSI manufacturing technologies

Objectifs (et/ou acquis d'apprentissages spécifiques)

Specific skills

Improve knowledge on

> Semi-conductor physics

> The internal details of electronic components (diodes, MOSFET, BJT, ...)

> How to use basic components for amplifier circuits

At the end of the course, the student should be able to

> understand the physics of semiconductor components

> calculate the properties of circuits using semiconductor components, based on a biasing and a small-signal analysis

> use the SPICE simulator

> manipulate concepts related to the frequency response of the components

> evaluate the imperfections of amplifier circuits in order to propose an adequate solution

Méthodes d'enseignement et activités d'apprentissages

Lectures (24h=12x2h)
Labs (36h=9x4h) in groups of 2 to 3 students

> learn to use the SPICE simulator by analyzing MOSFET amplifier circuits

> learn to use the CAD software to design Printed Circuit Boards,

> solder components on the PCB and test the PCB with lab equipment

Références, bibliographie et lectures recommandées

FLOYD TL
"Électronique composants et systèmes d'applications"
Editions Reynald Goulet
SEDRA/SMITH
"Microelectronic Circuits"
Oxford University Press
MANCINI R
"Op-amps for every one"
www.ti.com/lit/an/slod006b/slod006b.pdf
CARTER B
"Handbook of Operational Amplifier Applications"
www.ti.com/lit/an/sboa092a/sboa092a.pdf

Autres renseignements

Lieu(x) d'enseignement

Solbosch

Contact(s)

Titulaire : François Quitin
Assistant responsable : Renaud Theunissen

Méthode(s) d'évaluation

Autre

Méthode(s) d'évaluation (complément)

> The written exam evalutes both the lectures and the labs

> The written exam is "open-book", students can use their notes

> A lab exam is organized to evaluate the lab learnings, i.e. the student will have to use the SPICE software to analyze a

circuit. There is no second session mark for the lab exam, i.e. the first session mark of the lab exam will count for the final grade of the course.

Construction de la note (en ce compris, la pondération des notes partielles)

The grade is split as follows: 1/3 on the lab exam, 2/3 on the written exam. There is no second session mark for the lab exam, i.e. the first session mark of the lab exam will count for the final grade of the course.

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRCB | Master : ingénieur civil biomédical | finalité Spécialisée/ bloc 1